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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,082	03/11/2004	Robert Mergen	MERGEN ET AL 3	5645

7590 05/05/2005

COLLARD & ROE, P.C.
1077 Northern Boulevard
Roslyn, NY 11576

EXAMINER

MORILLO, JANEL COMBS

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 05/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/798,082	Applicant(s) MERGEN ET AL.	
	Examiner Janelle Combs-Morillo	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 April 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 1, 2005 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 20, 23-27, 29, 32-35, 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita (US 6,638,375) in view of Dasaki (US 6,706,126).

Fujita teaches an aluminum bearing alloy comprising: 3-40% Sn, 0.5-7% Si, 0.05-2% Fe (see Fujita at cl. 1), and optionally 0.01-2% Zr (cl. 10) and 0.1-5% Cu, Mg, or Zn, which overlaps the presently claimed alloying ranges of instant claims 20, 23-27, 29, 32-35, 38-39.

Overlapping ranges have been held to be a prima facie case of obviousness, see MPEP § 2144.05. It would have been obvious to one of ordinary skill in the art to select any portion of the range, including the claimed range, from the broader range disclosed in the prior art, because the prior art finds that said composition in the entire disclosed range has a suitable utility.

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Fujita teaches said alloy is used for a bearing alloy, and teaches said alloy is preferably clad with an aluminum foil bonding layer, to promote bonding between the aluminum bearing alloy and the protective steel shell (column 5 lines 44-68). Fujita does not mention other particulars of the bearing structure, ie. the running layer, base layer, etc. Desaki, who is also drawn to Al-Sn bearing structures (in particular, sliding or 'plain' bearings, see Desaki at column 1 lines 7-8), teaches substantially similar bearing alloys can be part of a two or three layer bearing structure (both comprising a backing metal, and wherein aluminum alloy with hard and soft particles is the lining, column 4 lines 35-46), and wherein a coating of resin such as polyimide (PI) or polyamid imide are used with a solid lubricant MoS₂ to prevent seizure (column 4 lines 48-54). Said coating is applied to the lining, and acts as the running layer. The "backing material" and "lining" taught by Desaki are analogous to the instant "protective shell" and "base layer", respectively.

It would have been obvious to one of ordinary skill in the art to use the Al-Sn alloy taught by Fujita for a base layer, in-between the protective shell and running layer of the bearing alloy structure taught by Desaki, because Fujita teaches said bearing alloy containing both hard and soft particles exhibits antiseizure properties without reduction in fatigue resistance (column 2 lines 31-32), and Desaki teaches a thin coating lubricant layer (for the running layer) applied to the Al alloy layer is effective for preventing the seizure from occurring in the initial operation period (column 4 lines 48-54).

4. Claims 21 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita (US 6,638,375) in view of Desaki (US 6,706,126).

Concerning claims 21 and 30, the bearing structure taught by Fujita in the preferred embodiment is a three layer bearing structure. However, it is known to make similar Al low Sn alloys into two or three layer bearing structures, which is supported by Desaki. In particular, Desaki, who is also drawn to Al-Sn bearing structures (in particular, sliding or 'plain' bearings, see Desaki at column 1 lines 7-8), teaches substantially similar bearing alloys can be part of a two or three layer bearing structure (both comprising a backing metal, and wherein aluminum alloy is the lining, column 4 lines 35-46), and wherein a coating of resin such as polyimide (PI) or polyamid imide are used with a solid lubricant MoS₂ to prevent seizure (column 4 lines 48-54). Said coating is applied to the lining, and acts as the running layer. The "backing material" and "lining" taught by Desaki are analogous to the instant "protective shell" and "base layer", respectively. The three layer structure of Desaki incorporates a bonding layer, in order to improve compatability. Therefore, it can be seen that it is generally known in the art to apply bonding layers as a third layer to a bearing structure, in order to improve compatability.

On the other hand, a bearing structure with a 2 layer structure of a base layer and a protective shell is held to be an obvious expedient of Fujita combined with Desaki, because the omission of a step or element and its function is obvious if the function of the step or element is not compulsory, MPEP 2144.04, Ex parte Wu, 10 USPQ 2031 (Bd. Pat. App. & Inter. 1989). See also In re Larson, 340 F.2d 965, 144 USPQ 347 (CCPA 1965) (Omission of additional framework and axle which served to increase the cargo carrying capacity of prior art mobile fluid carrying unit would have been obvious if this feature was not desired.); and In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) (deleting a prior art switch member and thereby eliminating its function was an obvious expedient). Note that the omission of an element and

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retention of its function is an indicia of unobviousness. In re Edge, 359 F.2d 896, 149 USPQ 556 (CCPA 1966). Applicant has not shown unexpected compatability with regard to the overlapping alloy composition taught by the prior art, in the form of said bearing structure.

5. Claim 22 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita, as applied to claims above, in view of “ASM Handbook: Vol. 18 Friction, Lubrication, and Wear Technology” (hereinafter “ASM Vol. 18”) pp 741-753.

Fujita does not teach the application of a layer of Pb, Sn, Bi, In, or Cu to said base layer Al-Sn-Zr alloy. However, “ASM Vol. 18” teaches that a thin layer of Sn or Pb can be applied to bearing material systems (see Tables 3 and 4 on p. 747-748), and such bearings “have high tolerances for boundary and thin-film lubrication conditions, and thus can be used under higher loads than can any of the bimetal systems”, p 748, 1st column. It would have been obvious to one of ordinary skill in the art to apply a thin surface layer of Sn or Pb to the base layer taught by Fujita and Desaki, because “ASM Vol. 18” teaches that said layer allows bearing to be used under higher loads.

6. Claims 28, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita (US 6,638,375), as applied to claims above, further in view of GB2358406 (GB’406).

Fujita teaches an Al-Sn-Si-Fe bearing as stated above. Fujita does not mention Sc in said alloy composition. However, GB’406 teaches that 0.015-2.5% Sc can be adding to Al-Sn alloys intended for plain bearings, wherein said Sc addition improves the mechanical properties of the bearing alloy, improves adherence strength between the individual layers, reduces susceptibility to hot tearing, and improves weldability (page 10). It would have been obvious to one of ordinary skill in the art to add Sc to the Al-Sn bearing alloy taught by Fujita because GB’406

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teaches said addition improves strength, and improves performance as a bearing layer (see GB'406 at p. 10).

Response to Amendment/Arguments

7. In the response filed on April 1, 2005, applicant added new claims 20-39, and submitted various arguments traversing the rejections of record. Applicant's argument that the present invention is allowable over the prior art of record because the aluminum bearing alloy taught by Fujita is analogous to the running layer, or that because Fujita teaches a preferred bonding layer inbetween the protective shell and the base layer, has not been found persuasive. As stated above, a bearing structure with a protective shell, base layer out the Al-Sn alloy taught by Fujita, and running layer is held to be an obvious expedient of the prior art teachings. In particular, the omission of the bonding layer and its function of improving compatability is obvious if the function of the step or element is not compulsory, MPEP 2144.04. The prior art teaches that substantially similar Al low Sn alloys have good compatability (see discussion above, see also ASM Vol. 18 Table 12, Table 4). Note that the omission of an element and retention of its function is an indicia of unobviousness. In re Edge, 359 F.2d 896, 149 USPQ 556 (CCPA 1966). Applicant has not shown unexpected compatability with regard to the overlapping alloy composition taught by the prior art, in the form of said bearing structure.

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Conclusion


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janelle Combs-Morillo whose telephone number is (571) 272-1240. The examiner can normally be reached on 8:30 am- 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCM

April 29, 2005


GEORGE WYSZOMIERSKI
PRIMARY EXAMINER
GROUP 1700